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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/726,370	12/03/2003	Tomohide Takami	SHIO-0046	7127

7590 08/16/2006

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EXAMINER
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SONG, MATTHEW J

ART UNIT	PAPER NUMBER
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1722

DATE MAILED: 08/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/726,370

**Applicant(s)**

TAKAMI, TOMOHIDE

**Examiner**

Matthew J. Song

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 June 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Withdrawn Rejections***

1. Applicant's arguments, see page 3 of the remarks, filed 6/23/2006, with respect to the 35 U.S.C 112 second paragraph rejection have been fully considered and are persuasive. The rejection of claims 1 has been withdrawn.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 3 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 3 requires a joint having a diameter less than that of the portions of the nanofiber preceding and following the joint. The original specification merely provides support for a constriction. There is no support for a joint having a diameter less than the portions preceding and following a joint.

4. Claim 5 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the

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inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 5 recites, “the diameter of the nanofiber is approximately equivalent to the size of the microcrystal grain” in lines 1-2. The original specification teaches applying grains to form nanowires and the nanofiber is composed of a plurality of nanowires. The grain is approximately the size of the nanowire, not the nanofiber.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-4 and 6-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Westwater et al (US 5,858,862).

Westwater et al teaches a method of producing silicon nanowires which are grown into desirable shapes as to be uniform in diameter without any bending (abstract). Westwater et al teaches silicon nanowires bundled in the same direction with a space between nanowires, such that a nanofiber has a stem shaped cross-sectional configuration, note Figure 3 and 4. Westwater et al's Figure 1C and 3 are similar to applicant's Figure 1C; therefore Westwater et al teaches a stem shaped cross sectional configuration.

Referring to claim 2, Westwater et al teaches the base of the nanowires has a larger diameter than the upper portion of the nanowire (Fig 3). The upper portion which is narrower reads on applicant's joint portion shaped like a constriction where a diameter is smaller.

Referring to claim 3, Westwater teaches nanowires having a bottom portion having a large diameter than a middle portion and a upper portion of the nanowire having a diameter large than the middle portion, note Fig 3, this middle region reads on applicant's joint having a diameter less than that of the portions of the nanofiber preceding and following the joint.

Referring to claim 4 and 6-9, claims 4 and 6-9 further limit the product claim by specific the method of manufacturing. The patentability determination of a product-by-process claim is based on the patentability of the product and does not depend on its method of production (MPEP 2113). Westwater discloses all of the claimed product limitations; therefore meets the claimed limitations because the method of production is not given patentable weight.

7. Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Okajima et al (US 5,381,753).

Okajima et al teaches a method of producing silicon needle like crystals, which grown in a vertical direction only at a place where a liquid drop is situated on a silicon substrate (col 4, ln 45-60), this reads on applicant's nanowires. Okajima et al teaches silicon nanowires bundled in the same direction with a space between nanowires, such that a nanofiber has a stem shaped cross-sectional configuration, note Figure 1(b). Okajima et al's Figure 1(b) is similar to applicant's Figure 1C; therefore Okajima et al teaches a stem shaped cross sectional configuration.

Referring to claim 2, Okajima et al teaches the base of the silicon needle like crystal has a larger diameter than the upper portion of the needle like crystal, note figure 1(b). The upper portion which is narrower reads on applicant's joint portion shaped like a constriction where a diameter is smaller.

### ***Response to Arguments***

8. Applicant's arguments filed 6/23/2006 have been fully considered but they are not persuasive.

Applicant's argument that the prior art does not teach a nanofiber comprised of numerous nanowires is noted but not found persuasive. Applicants allege that the prior art does not teaches the "bundled" limitation. Merriam Webster's online dictionary defines "bundle" as "a small band of mostly parallel fibers". Okajima and Westwater both disclose a band of parallel nanowires ('753 Fig 1b and '862 Fig 3); therefore Okajima and Westwater meets applicant's bundled limitation.

Applicant's argument that Okajima and Westwater teach Vapor-Liquid-Solid process that produce much different products is noted but is not found persuasive. The patentability determination of a product-by-process claim is based on the patentability of the product and does not depend on its method of production (MPEP 2113). Okajima and Westwater teach all of the claimed product limitations; therefore Okajima and Westwater reads on the claimed invention.

### ***Conclusion***

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9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

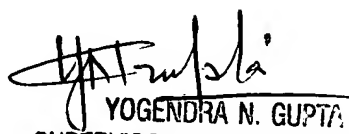
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Song whose telephone number is 571-272-1468. The examiner can normally be reached on M-F 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yogendra Gupta can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Matthew J Song  
Examiner  
Art Unit 1722

  
YOGENDRA N. GUPTA  
SUPERVISORY PATENT EXAMINER  
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MJS  
August 14, 2006